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DATE MAILED: 09/26/95

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☐ Responsive to communication filed on _____ ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), 0 days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☒ Notice of References Cited by Examiner, PTO-892.
2. ☒ Notice of Draftsman's Patent Drawing Review, PTO-948.
3. ☒ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐ _____.

Part II SUMMARY OF ACTION

1. ☒ Claims 1-20 are pending in the application.

   Of the above, claims _____ are withdrawn from consideration.

2. ☐ Claims _____ have been cancelled.

3. ☐ Claims _____ are allowed.

4. ☒ Claims 1-20 are rejected.

5. ☐ Claims _____ are objected to.

6. ☐ Claims _____ are subject to restriction or election requirement.

7. ☒ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8. ☐ Formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).

10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____. has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).

11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).

12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____; filed on _____.

13. ☐ Since this application apppears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14. ☐ Other

EXAMINER'S ACTION

1. References not supplied herewith can be found in any of related serial numbers 07/289,355 08/456,339, 08/456,398, 08/457,194, 08/457,448, 08/457,726, 08/457,728, 08/458,142, 08/458,549, 08/460,607 or 08/460,705. An action, with associated references, has already been sent prior to the mailing of this action.

2. Claims 1-20 of this application conflict with claims 1-20 of each of the applications having serial numbers found in the appendix attached hereto.

37 C.F.R. § 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See M.P.E.P. § 822.

3. This application filed under 37 C.F.R. § 1.60 lacks the correct reference to the prior application. A statement reading "This is a Continuation-in-Part of application Serial No. 07/289,355, filed December 22, 1988" should be entered following the title of the invention or as the first sentence of the specification. Also, the present status of all parent applications should be included.

4. The present statement "This application is a continuing application continuing from parent application... 07/289,355..." is objected to as failing to comply with 37 C.F.R. § 1.60. The language "continuing application continuing" is vague in that it can be interpreted as "Continuation" or "Continuation-in-Part." It has been determined that the present application is shorter by approximately 150 pages than the parent (07/289,355) which

disqualifies this application from the status of Continuation; further since matter has been added to or deleted from the specification this application cannot qualify as Divisional. Accordingly this application is a Continuation-in-Part, and applicant is required to amend the disclosure to reflect the correct status of the present case.

Applicant is further requested to indicate the nature and location of any matter added to or deleted from the present specification with regards to the parent.

5. **Applicant is strongly requested, in his response to this Office Action, to inform the Office of all copending identical or related applications filed in the period from May 1, 1995 to June 8, 1995.** This requirement is made in view of the discovery by the Office of a substantially concurrent filing of approximately 400 applications by applicant claiming identical or related subject matter. In anticipation of a substantial burden on the Office in:

(I) locating and/or processing those applications disclosing and/or claiming identical or related subject matter;

(II) maintaining consistency of examination in those applications disclosing and/or claiming identical subject matter;

(III) determining whether double patenting may be a consideration in those applications disclosing and/or claiming related subject matter;

this requirement of disclosure is appropriate. Applicant may amend the disclosure of this application to make the appropriate cross-references per 37 CFR 1.78(a)(2).

6. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

7. The attempt to incorporate subject matter into this application by reference to US Applications Serial Numbers

06/661,649; 06/662,211; 06/663,094 is improper because only a US Patent or an allowed US Application may be incorporated by reference into the disclosure as essential material.

8. Claims 1-20 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Rejected claims will be addressed hereinbelow by boldface numbers.

1: "Spatial means for spatially processing a geometrically processed rotated, translated, scaled and perspective processed image" (lines 8-11) is vague and indefinite: "A geometrically processed... image" lacks clear antecedent. Further the claims as a whole is vague. "Spatially processing" is not defined in the claim and it is not clear what it means, and particularly what relationship "aliasing" has to this processing. "Aliasing" also has no antecedent in the claim and is also a purely functional limitation.

3: "Registering the input image and the reference image" (lines 4-5) is vague and indefinite: What is meant by "registering"? Lining up the two images, or some sort of indexing? "Comparing the registered input image and reference image" (lines 6-7) is vague: Does this mean the original reference image or the "registered" reference image?

5: "A database image" (line 2) is vague and indefinite. Interpreting this as "an image of a database" is meaningless; thus this apparently refers to a database consisting of a single image. A database by definition comprises more than a single image; to characterize a database as consisting of a single image

is repugnant to the accepted definition of the term "database" and prohibited by MPEP §608.01(o).

"Means for scrolling... to provide image motion" (lines 5-6) is vague and indefinite as well as functional: The concept of "motion" of an image in memory is undefined and makes no sense, further no known type of device capable of manifesting "image motion," such as a display, has been recited.

7: "Scanning out" (eg, line 3) is vague and indefinite. Applicant is apparently using the term "scanning out" to mean "reading out." Webster's New World College Dictionary defines "scan" as "To examine items (in a file) in sequence in order to find those that meet a particular criterion"; because there is no recitation in the claim or disclosure directed to "examining items in sequence in order to find those that meet a particular criterion" the use of the term is repugnant to its accepted meaning and violates MPEP §608.01(o). This rejection applies to all other claims containing the term "scanning out."

8: "Scanning out the image... at an angle" (lines 4-5) is vague: "Angle" is not defined and has no antecedent, ie, at an angle relative to what reference?

9: "Scanning out the image... at greater than pixel sampling steps" (lines 4-5) is vague: "Sampling steps" and "pixel" have no antecedent in the claim.

11: "Scanning out the image... at less than pixel sampling steps" (lines 4-5) is vague as in claim 9.

12: "scanning out the image... at varying pixel sampling steps" (lines 4-5) is vague as in claim 9.

13: "scanning out the image... at range variable pixel sampling steps" (lines 4-5) is vague as in claim 9. "Range" has no antecedent or definition.

14: "scanning out the image... at range variable angle" (lines 4-5) is vague: "Range" and "angle" lack antecedent or definition.

15: This claim is vague and indefinite to such an extent as to be unintelligible. Each of an "input means," "storing means" and "processor" are recited as performing the same operation of "generating" some type of "samples." Accordingly the term "generating" is vague since it is indeterminate what it is intended to mean, ie whether each of "input means," "storing means" and "processor" performs the same or a different operation.

"An input means for generating a sequence of spatial samples" (lines 2-3) is vague and indefinite: Spatial samples of what? Does this mean samples of a "spatial" signal or signal samples which possess a quality of being "spatial"? In either case the term "spatial" has not been defined.

"Storing means for generating a sequence of a plurality of parallel spatial samples" (lines 4-6) is vague: "Generating" is a function inconsistent with "memory" since the only accepted function of memory is "storage." "Parallel spatial samples" is undefined and lacks antecedent: Both "parallel" and "spatial" lack definition. Parallel to one another or to some external standard? "A sequence of a plurality of spatial samples" is unintelligible: Does this mean a plurality of samples which is in sequence, or a sequence of samples which is by definition a plurality, or sequence of pluralities of samples?

"A processor for generating a sequence of spatial samples" (lines 7-9) is vague and indefinite: "Spatial" is not defined and "spatial samples" has no clear antecedent.

The progression from "a sequence of spatial samples" to "a sequence of a plurality of parallel spatial samples" to "a sequence of spatial samples" is unintelligible, and violates the prohibition on the use of "a confusing variety of terms for the same thing" per MPEP §608.01(o). For example, the claim recites the identical term "sequence of spatial samples" as the input to the system and the output of the system.

16: "Means for generating the sequence of spatial samples" (lines 11-13) is functional. "Said processor" (line 13) lacks a clear antecedent.

17: "A database memory.." (lines 2-5) is vague and indefinite. "Where each of the image locations stores the image having different amounts of compression from the image stored in the others of the plurality of image locations" is unintelligible: "The image" lacks a clear antecedent in both recitations and improperly refers in the singular to multiple images. "The image" at lines 7, 8, 11 and 13 also lacks antecedent.

"Compression means for selecting an amount of compression of the image" (lines 6-7) is vague: Does this mean selecting an amount of compression prior to storage or selecting a stored image based on the amount by which it has been compressed?

18: "Stored program digital computer" (line 5) is vague: Does this mean a computer hardware element or a computer software element or both together? "Frame related information" (lines 5-6) and "pixel related information" (lines 7-8) are vague and

indefinite: "Frame related" and "pixel related" have no antecedent or definition in the claim.

"Processing pixel related information in response to the frame related information generated with said computer" (lines 7-8) is vague: No "generated information" has been recited.

Also, the terms "stored program digital computer for processing frame related information" and "digital processing logic for processing pixel related information" represent a confusing variety of terms for the same thing prohibited by MPEP §608.01 (o). "Computer" implies hardware while "logic" implies software, yet both are clearly analogous since each is recited as "processing... information" in a "processing system."

9. Claims 2 and 4 are rejected under 35 U.S.C. § 112, fourth paragraph, as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Claim 2 improperly recites an augmented system which exceeds the scope of claim 1 from which it depends. "display monitor" does not limit any element properly falling within the bounds of claim 1, but presents a new combination having greater scope and functionality than that of claim 1.

Claim 4 improperly recites an augmented system which exceeds the scope of claim 3 from which it depends. "Artificial intelligence means for processing the output signal" does not limit any element properly falling within the bounds of claim 3, but presents a new combination having greater scope and functionality than that of claim 3.

10. In view of the numerous ambiguities in the claims and specification, as indicated in paragraphs 2-4, above, the claims are interpreted as best that they are understood, and the prior

art is applied (in paragraphs 11-26, below) in accordance with this understanding.

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claim 15, as best that it is understood, is rejected under 35 U.S.C. § 102(b) as being anticipated by Endou et al.

As applied to claim 15, Endou discloses a spatial processor comprising: an input circuit (inherent as pixels are input to the system via the I/O line in Fig. 2); a memory (comprising element 6); a processor (generally comprising 14 in Fig. 2). See: Abstract; Figs. 1-29; column 1, line 40 to column 3, line 68; and column 6, line 3 to column 10, line 68.

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same

person or subject to an obligation of assignment to the same person.

13. Claim 16 is rejected under 35 U.S.C. § 103 as being unpatentable over Endou et al.

The statements advanced in paragraph 12, above, as to the applicability and disclosure of Endou et al. are incorporated herein.

With respect to claim 16, Endou also discloses the use of: a multiple line buffer as part of the memory; a kernel of a plurality of pixel registers; a weight memory; and means for applying the weights to the input data. See the sections of Endou that are pointed out above. However, Endou does not explicitly state that a "geometric processor" is supplying the input stream of pixels. However, as best that the limitation in the claim can be deciphered, it appears that this limitation would at least be an obvious part of the system of Endou, if not actually an inherent part, as the system does indeed receive a stream of input pixels (the I/O line), where the pixels are a sequence of pixels. Therefore, to one of ordinary skill in the art, it would have been obvious, at the time of the invention, to include a means to provide this stream of pixels that are being processed by Endou as the system is receiving the pixels and it is necessary that there be some means to supply this stream.

14. Claim 18 is rejected under 35 U.S.C. § 102(b) as being anticipated by Schure et al.

As applied to claim 18, Schure discloses an image processing system comprising: an input device that includes a video camera and memory (comprising 65 and 60 in Fig. 1); an image processor that "includes a stored program digital computer processing frame related information" (see Figs. 2, 4, 5a-b), where the processor

includes a "geometrical processor" and "interpolation logic"; and a display (23). See: Abstract; Figs. 1-8b; column 2, line 36 to column 3, line 39; and column 4, line 8 to column 6, line 62.

15. Claim 19 is rejected under 35 U.S.C. § 103 as being unpatentable over Schure et al.

The statements advanced in paragraph 14, above, as to the applicability and disclosure of Schure et al. are incorporated herein.

As to claim 19, all of the elements are shown except the reference does not explicitly show the addressing circuit as recited in the claim. However, the use of such addressing circuits are extremely well known (Official Notice) and, to one of ordinary skill in the art, it would have been obvious, at the time of the invention, to use this type of addressing circuit in Schure et al. as the reference does show a memory and there must be an addressing circuit for the system to extract data from the memory and for the system to work.

16. Claim 20 is rejected under 35 U.S.C. § 103 as being unpatentable over Schure et al. as applied to claims 18 and 19 above, and further in view of Robinson et al.

As to claim 20, Schure et al. shows all of the limitations, except that the reference does not appear to show the limitations directed to the use of a kernel and a weighted window. However, this is an extremely well known and conventional procedure. Robinson is cited for showing these features. See: Abstract; Figures 1-6; column 1, lines 22-40; and column 2, line 1 through column 4, line 56. To one of ordinary skill in the art, it would have been obvious, at the time of the invention, to use a kernel and weighted window process, as shown by Robinson, in the system of Schure et al. because of the conventionality of such processes

and because each system is for the processing of images and these procedures are extremely conventional in nearly all image processing systems.

17. Claims 1, 7, 15, and 18, as best understood, are rejected under 35 U.S.C. § 102(b) as being anticipated by Marsh.

As applied to claims 1, 7, 15, and 18, Marsh discloses a system comprising: a data base memory (48) in Fig. 1; an image memory (304, 306, in Fig. 3, makes up part of element 46 in Figs. 1 and 3. Additionally, each of the stages 60-65 also contain memories for storing the image data that they are operating upon. Any of these memories can be read on the extremely broad recitation in the claims.) for storing an image (where the image is accessed from part of the data base 48); an accessing circuit for accessing the image from the memory (processor control logic 70 in Fig. 1 and see column 3, lines 10-12); a processor (comprising elements 60, 60C, 62, 63, 64, 65 and 72 in Fig. 1, and referred to more specifically in subsequent Figs.) for processing the image stored in the memory, where the processor performs the following processes: translation, rotation, scaling, compression (reduction), expansion, texture, topography, map, roll, pitch, occulting, perspective, and 3D image production; and a display to display the processed image (82 in Fig. 1). Further, see: Abstract; Figs. 1-11; column 1, lines 6-14, 31-51; column 2, line 21 to column 3, line 41, particularly column 2, lines 29-34, 35-43, 54-66, and column 3, lines 1-19, 26-31; column 4, line 21 to column 5, line 52 (which discusses producing processed images at varying resolutions); column 6, lines 28-68; column 7, lines 55-68; column 8, lines 14-27, 44-49; column 9, lines 29-62; column 10, lines 23-50; column 11, line 13-52; column 12, line 49 to column 13, line 57, particularly column 12, lines 65-68 and column 13, lines 54-57; column 16, lines 53-68;

column 28, lines 23-43; column 29, lines 36-60; column 31, line 60 to column 33, line 8; and column 36, line 55 to column 37, line 17.

With further regard to claim 1, the recitation directed to the "spatial means" producing an image having "reduced aliasing" is apparently satisfied by Marsh (as best that the limitation is understood), as Marsh processes the geometrically processed images to produce the display image, and this further processing would satisfy the limitation of a "spatial means" and would produce an image that has "reduced aliasing" with regard to at least selected other images (it is noted that there is no recitation indicating with respect to what the "aliasing" is "reduced" and that, further, the limitation is purely functional and is therefore given the weight according to being purely functional.).

As to claim 7, as well as other claims with similar recitation, for prior art purposes, the recitation of "scanning out the image stored in the memory" is interpreted to mean "reading out the image stored in the memory", as this is what the claim recitation appears to mean. The reference clearly shows reading the image out of the memory and sending the image to the processor for processing.

As to claim 18, the above analysis applies, except that this claim broadly recites "frame related information". This is met by Marsh as it processes image data for a frame of image data, and there are stored instructions (a program) that controls the processing.

18. Claim 10 is rejected under 35 U.S.C. § 103 as being unpatentable over Marsh.

The statements advanced in paragraph 17, above, as to the applicability and disclosure of Marsh are incorporated herein.

With respect to claim 10, Marsh shows using various memory components (as indicated above), including various RAM's (such as 306 and others) and memories that appear to be read-only memories (the data-base memory 48 and the shape memory 60M). However, Marsh does not specify that these memories are comprised of "a plurality of integrated circuit ROMs" as required by this claim. To one of ordinary skill in the art, it would have been obvious, at the time of the invention, to use "a plurality of integrated circuit" memories (ie., a plurality of memory chips) as these memories of Marsh because of the conventionality of the use of such devices as memories in processing systems and because integrated circuit memories take up less space than bulkier memory devices (Official Notice). Further, as to the specific use of ROMs, while elements 48 and 60M appear to be read-only types of memories, Marsh does not explicitly state this. However, to one of ordinary skill in the art, it would have been obvious, at the time of the invention, to implement these devices as read-only memories, as these memories contain the data that is being accessed and processed, and are the references that are used to produce the images displayed on the displayed. Further, the contents of these memories are not intended to be changed, and the use of a ROM would allow for power to be removed from these devices when the system is off without losing the reference data. Additionally, it is extremely conventional to use read-only memories to construct a data-base memory (Official Notice).

19. Claims 2, 5 and 6 are rejected under 35 U.S.C. § 103 as being unpatentable over Marsh as applied to claims 5, 7, 10, 15, and 18 above, and further in view of Sawada et al.

With regard to claim 2, while Marsh does disclose various memories (see above), the reference does not show the use of an "optical disk" for storing the image in analog form. However,

the use of optical disks to store images in analog form are extremely well known. Sawada et al. is cited as showing the conventionality of optical disks for the storage of images. Further, the reference indicates that the memory "device 10 such as a magnetic disk, an optical disk device or the like" (column 3, lines 13-14) can apparently be any type of conventional memory, thus suggesting the general interchangability of the various memory types. Therefore, to one of ordinary skill in the art, it would have been obvious, at the time of the invention, to use an optical disk as part of the memory of Marsh because of the suggestion in Sawada of using various types of memory devices and because of the conventionality of these various types of memories.

With regard to claims 5 and 6, while Marsh does update the displays and includes a memory management control (it is inherent when using a memory that there must be some form of memory management), it does not indicate the specifics as to how the updating and management are performed, though it is clear that movement is indeed simulated by the system by a management and updating process. Sawada et al. discloses a system similar to Marsh, wherein Sawada shows performing a scrolling operation (and corresponding means to control the display and manage the memory) to simulate movement. In Sawada, see: Abstract; Figs. 1-8; column 2, line 12 to column 2, line 31; and column 3, line 11 to column 4, line 4. To one of ordinary skill in the art, it would have been obvious, at the time of the invention, to use a scrolling operation (and corresponding means to control the display and manage the memory) to simulate movement in Marsh, as is shown in Sawada, because both systems are for performing a similar function and because the use of scrolling is a well known method of simulating movement when using displayed images and because the control and management of the memory are common and

conventional (as well as inherent) process in such systems. Additionally, as to the recitation directed to the respective sizes of the database and the image memory, while the references do not specify the exact sizes of these memories (both show a database memory and an image memory) it is extremely conventional, if not actually inherent, that a database memory is substantially larger then an auxiliary memory (ie., the image memory) as a database is intended to store a large amount of data that is to be accessed in smaller chunks for separate or remote processing. Therefore, the specific sizes are simply a matter of routine design choice and simply follow conventional standards where the database is substantially larger than a auxiliary memory.

20. Claims 8, 9, 11, 13, and 14 are rejected under 35 U.S.C. § 103 as being unpatentable over Marsh as applied to claims 7, 10, 15, and 18 above, and further in view of Sacks et al.

With respect to claim 8 specifically, Marsh discloses the rotation of an image, but does not appear to perform the rotation by actively scanning the memory at specific angles to generate the rotation. However, the function of scanning a memory at specific angles, or in a specific way, to perform a desired transformation is well known. Sacks et al. is cited as being directed to a system for rotating an image by rotationally scanning out a memory, where selected memory locations are addressed in accordance with the desired amount of rotation to perform the rotation of the image. See: Abstract; Figs. 1, 2, 4-7; column 6, lines 6-60; and column 10, line 61 to column 12, line 68. To one of ordinary skill in the art, it would have been obvious, at the time of the invention, to perform the rotation of Marsh in the manner of Sacks (rotationally scanning the memory) because both systems are directed to the rotation of an image

stored in a memory and so as to perform the rotation easier and quicker, as indicated by Sacks et al.

As to the other claims (9, 11, 13 and 14), these claims are directed to various other transformations that are being performed by Marsh (see above discussions with regard to other claims directed to these transformations). Similar to the rotation by scanning of the memory in a particular order to perform a desired transformation, these other transformations can also be performed by this process of Sacks. Therefore, to one of ordinary skill in the art, it would have been obvious, at the time of the invention, to perform a scanning of the memory to perform these transformations that are being performed by Marsh in view of the teachings of Sacks which performs a rotation process by scanning of memory.

21. Claims 9 and 11 are rejected under 35 U.S.C. § 103 as being unpatentable over Marsh as applied to claims 7, 10, 15, and 18 above, and further in view of Potter.

With respect to claims 9 and 11, Marsh discloses the compression and expansion (scaling) of an image, but does not appear to perform the scaling by scanning the memory at a sampling rate different than that of the pixel sampling rate to generate the scaling. However, the function of sampling rate different than that of the pixel sampling rate to perform a desired transformation is well known. Potter is cited as being directed to a system for scaling an image by sampling the memory data at a rate different than that of the pixel sampling rate. See: Abstract; Figs. 1-5; column 1, lines 18-51; and column 2, lines 10-65. To one of ordinary skill in the art, it would have been obvious, at the time of the invention, to perform the scaling of Marsh in the manner of Potter (the sampling rate being different than that of the pixel sampling rate) because both

systems are directed to the scaling of an image stored in a memory and so as to perform the scaling easier and quicker and in real time.

22. Claim 12 is rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Marsh and Sacks as applied to claims 7-11,13-15, and 18 above, and further in view of Nickel.

With respect to claim 12, the combination of Marsh and Sacks show performing the warp by a scanning out of selected locations in memory to perform the transformation. However, they do not show the transformation of images, where the transformations include a warp transformation. However, the process of warping image data is a very well known type of transformation of images (along with translation, rotation, and scaling, warping is one of the basic types of image transformations that are performed on images). Nickel discloses an image processing system that shows this very conventional process of performing image warping transformations. See: Abstract, lines 7-20; Figs. 4, 9; column 2, line 50 to column 3, line 12; column 4, lines 31-52; and column 6, lines 8-63. To one of ordinary skill in the art, it would have been obvious, at the time of the invention, to perform an image warping as part of the image transformations of Marsh, because each system is for the processing and transformation of images to produce transformed images and because of the conventionality of performing warp transformations as well as the other transformations that are explicitly shown by Marsh.

23. Claim 17, as best that this claim is understood, is rejected under 35 U.S.C. § 103 as being unpatentable over Marsh as applied to claims 7, 10, 15, and 18 above, and further in view of Knowlton.

With respect to 17, Marsh shows all of the elements, except that the reference does not explicitly show the limitations of the first recited means (the specifics being the "image locations stores the image having different amounts of compression from the image stored in the others of the plurality of image locations" in lines 3-5), although the reference does indicate that different resolutions of the image data stored in the data-base are used (see column 4, line 42 to column 6, line 7, for example). Knowlton discloses an image processing system which discloses the well known process of producing, selecting and storing images at different locations and at different resolutions. See: Abstract; Figs. 1-7; column 1, line 13 to column 2, line 68; and column 3, line 34 to column 4, line 67. To one of ordinary skill in the art, it would have been obvious, at the time of the invention, to store the images at different resolutions, to select the desired resolution (also shown by Marsh by code "RR") and to access the stored image as shown by Knowlton in the system of Marsh because of the conventionality of this process and because each system is for the processing of images and, further, because Marsh already selects a resolution for the image data being processed and the process of already having these resolutions stored, rather than having to calculate on the fly, would speed the system which is very desirable in systems like Marsh.

24. Claims 1-4, as best that they are understood, are rejected under 35 U.S.C. § 103 as being unpatentable over Sacks et al.

With respect to claims 1-4, Sacks et al. disclose an image processing system, comprising: an input device (comprising elements 14 and 20 in Fig. 1) for acquiring an input image; a memory (element 16 in Fig. 1) for storing a reference image; a registration processor (comprising elements 10 and 18 in Fig. 1)

for registering the input image and the reference image (these elements register the input and the reference images with respect to one another as they rotate the reference until it is registered in alignment with the input image, thus meeting the claim recitation); a means for comparing (comprising element 22 in Fig. 1) for comparing the registered input image and reference image (again, this limitation is met by Sacks et al., as element 22 compares the input image (from memory 20) with the reference image (from memory 16) where the images have been registered with respect to one another, where the registration has been performed by elements 10 and 18. Further, the claim language does not require that the registration processor and comparing processor be directly connected.); and a means for generating an output signal in response to the comparing of the registered input image and reference image by said means for comparing (which can be read on either element 24 or on the output line from element 10 (both in Fig. 1), or, at worst, the use of an output circuit to output the results of the processing would have been abundantly obvious to one of ordinary skill in the art because, in most any system, after data is processed it needs to be output in some way so that it can be used for whatever purposes it was determined. If the processed data is not output in some way, even if only to another processing means, the processing would be meaningless, as it can not be used if it is not output in some way from the processing means. Thus, clearly, even if an output circuit was not shown by Sacks et al., the use of such a circuit would have been obvious because of the conventionality of such means and because of the necessity of such means.). Additionally, as to the recitation in claim 1 directed to the "spatial means"

As to the use of artificial intelligence and a spatial filter (claim 4), these are very conventional means for performing these recited processes (which are shown by Sacks)

and, to one of ordinary skill in the art, it would have been obvious to use these (conventional) recited means to perform these functions (Official Notice, see MPEP 706.02(a)). Additionally, the recitation of the transformations recited in the claim (translating and scaling) are well known and conventional transformation processes. The use of these registration processes is very conventional and standard in the art of registering images with one another to compensate for size and/or positional misalignments. Therefore, the use and performance of these processes in addition to the rotation of Sacks would also have been obvious to one of ordinary skill in the art because of the extreme conventionality of these various transformations (Official Notice). Similarly, the use of an optical disk as the memory of Sacks and a display (claim 2) would also have been obvious to one of ordinary skill in the art in view of the conventionality of the use of these types of memories and the use of displays in the processing of images to show the results of the processing (Official Notice).

Further Sacks also shows using a video input (14 in Figure 1 and 138 in Figure 7) which would be one or more video cameras (see column 3, lines 48-58, column 6, lines 6-24, and column 16, lines 13-15, 25, and 40-41).

Also Sacks is directed to a registration processing by the use of a rotating process of the images with respect to one another. See: Figure 3; column 5, lines 3-11; column 6, lines 29-35; and column 7, line 13 to column 8, line 39.

25. Claims 1-3 are rejected under 35 U.S.C. § 103 as being unpatentable over Hemstreet in view of Hobrough.

As applied to claims 1-3, Hemstreet discloses an image processing system, comprising: an input device for acquiring an input image (for example, elements 17, 19c, 18c, 21, 21c, 20c,

23c in Figure 1; Figure 4; 80, 81 in Figure 8); a memory for storing a reference image (16 in Figure 1; 74 in Figure 8); a comparing processor for comparing the reference image and the input image (22, 22n, 25 in Figure 1; Figure 6; 91-101u in Figure 8); and an output circuit for generating an output signal in response to the comparing of the input image and the reference image by the comparing processor (26 in Figure 1; 102a-u in Figure 8). Also, see: Abstract; Figures 1-8; column 1, line 25 to column 2, line 43, particularly column 2, lines 26-32; column 3, line 40 to column 4, line 10; column 4, lines 25-32; column 4, line 50 to column 6, line 26, particularly column 5, lines 32-48 and column 6, lines 12-25; column 8, line 41 to column 9, line 5; and column 10, lines 53-56. As to the limitation in claim 3 directed to "means for registering the input image and the reference image", while Hemstreet does not explicitly address this, the reference does state that the input and reference images must be synchronized one to the other for the system to properly compare the images (see, for example, column 4, lines 26-31 "[T]he sample is scanned synchronously with the drum movement" (where the sample is the input image and the reference is being read from the drum); and column 8, line 41 to column 9, line 5, particularly column 9, lines 1-4 which states that in "these embodiments, which embody a magnetic drum, or equivalent memory device, the scanning beam must be kept in accurate synchronism with the rotation of the magnetic drum" (emphasis added)). Therefore, it is clear that Hemstreet does recognize the criticality of having the input and reference images registered one to the other. Although Hemstreet is registering the images in time rather than in space, the two processes are related and analogous, as both processes are designed to ensure that picture elements from corresponding locations in the two images are being read out and compared at the same time.

Hobrough discloses an image processing system, wherein: images are input; the input images are registered one to another, with the registration processes including rotation, scaling, warping, perspective processing and various combinations thereof; the registered images are processed and an output is generated in response to the processing of the registered images. Further, as part of the registration processing, a correlation processing (similar to the claimed "comparing" in claim 3) is performed on the images to determine how much, if any, additional registration processing is needed for the images to be in full registration and the correlation is performed using an exclusive-or circuit (which is the same as Hemstreet's or-not-and circuit). See: Figures 1, 3, 4, 13-19, 22; column 1, line 39 to column 4, line 68; column 8, lines 7-20; column 29, line 10 to column 30, line 18; and column 66, line 48 to column 67, line 53. To one of ordinary skill in the art, it would have been obvious, at the time of the invention, to perform the various registration processes of Hobrough in the system of Hemstreet because of the conventionality of performing registration of two images with respect to one another (which is performed by both references) and because Hemstreet already recognizes the desirability and necessity of assuring that the two sets of image data are registered for proper comparison processing and for properly determining if the two images are the same. Additionally, in Figure 7, Hemstreet shows the overlaying and physical registration of two characters for comparison processing. Further, both systems are for inputting and processing sets of images. Also, it is again noted that Hobrough uses that same logic in the registration determination as does Hemstreet.

As to claim 2, Hemstreet uses a memory to store the reference image data, although the reference does not appear to use an "optical disk" as the memory device. However, Hemstreet

does state (column 9, lines 1-2) the use of "a magnetic drum, or equivalent memory device" (emphasis added). Therefore, since Hemstreet indicates that the memory can be an "equivalent" memory device, the use of an "optical disk" as the memory would have been obvious to one of ordinary skill in the art because of the conventionality of these memory devices and because of the suggestion in the reference for using an "equivalent" device, which would include an "optical disk" as recited in the claim.

With further regard to claim 1, which each recites the various types of registration processing performed (rotation, scaling, translation and various combinations of these processes) these are shown (individually and in combination) by Hobrough, as stated above, and their use would have been obvious for the reasons given above. Further, claim 1 also recites, the use of a "spatial means" to perform some vaguely specified process. While Hemstreet and Hobrough do not explicitly disclose using a "spatial means" to perform these functions, the use of "spatial means" is extremely well known and conventional in image processing (Official Notice). Further, "spatial filters" (which also includes "spatial means") are well known for performing various specific image processing techniques and the use of such conventional filters in the system of Hemstreet and Hobrough would have been obvious to one of ordinary skill in the art because of the conventionality of the use of these filters in image processing and further because it is simply a matter of implementing the processing of the prior art references in a known manner with known apparatus (Official Notice).

26. Claim 4 is rejected under 35 U.S.C. § 103 as being unpatentable over Hemstreet and Hobrough as applied to claims 1-3 above, and further in view of Nickel.

As to claim 4, the use of an "artificial intelligence processor", as it is recited in the claim, is extremely broad. The claim only recites that the "artificial intelligence processor" is used for "processing the output signal", though the claim does not specify what processing this "processor" may be performing, only that it in some way it is "processing the output signal". Hemstreet and Hobrough do process and output the images as recited in the claims and do show some processing of the output signal. For example, Hemstreet shows in Figure 1 taking the output signal (from element 26) and sending the signal to a "reject device", which produces an indication of the recognition or rejection of the input image. However, Hemstreet does not give details of the "reject device". Nickel discloses an image processing system wherein an input image and a stored reference image are registered to one another (including performing various warp transformations), and the output of the registration processing is submitted to a computer (40) and output device (46). See: Abstract; Figs. 1A-4, 9; column 1, line 32 to column 2, line 2; column 2, lines 35-68; column 3, lines 19-56; and column 4, line 31 to column 5, line 18. To one of ordinary skill in the art, it would have been obvious, at the time of the invention, to use the "artificial intelligence processor" or Nickel in the system of Hemstreet and Hobrough because of the conventionality of such processors and because each of the systems are for the aligning and combining/comparing of a set of image data. Further, the use of a computer and other processing means (as in Nickel) as part (or all) of the reject device of Hemstreet would have been obvious because Nickel is effectively supplying the details for the reject device disclosed by Hemstreet. Additionally, it is noted that the term used in the claim (an "artificial intelligence processor") is extremely broad. While this term can be interpreted as a neural network,

for example, or other sophisticated device, it can also be something as (relatively) simple as a microprocessor. Thus, the "general purpose computer" of Nickel (and even the "reject device" of Hemstreet) can be read on this extremely broad terminology, particularly since the claim does not provide any specific functions or structure for the claimed "artificial intelligence processor". Additionally, and just as important when interpreting the claim limitation, appellant does not appear to disclose, or show in the drawings, anything sophisticated (eg., a neural network is not shown or disclosed) as the "artificial intelligence processor". For that matter, there does not appear to be anything labeled as an "artificial intelligence processor" in the drawings. Therefore, it would appear that the only thing that may be interpreted as the "artificial intelligence processor" would be the "supervisory processor" (110S) in Figure 1A and other Figures.

With further regard to claim 4, Hemstreet uses a television camera (see column 3, lines 40-42, 60-63) which would apparently satisfy the claim limitation of a "video camera". Further, even if these cameras were determined to be different, it would clearly have been obvious to one of ordinary skill in the art to use any conventional type of image pick-up device that is readily available to produce image data for processing because each of these devices are functionally equivalent for the purpose of producing image data.

27. Claims 1-20 are provisionally rejected under 35 U.S.C. § 101 as claiming the same invention as that of claims 1-20 of each of the following copending applications: 08/464034, 08/463583, 08/464979, 08/465198, 08/465173, 08/465071, 08/465657, 08/463823, 08/463822, 08/465072, 08/463111, 08/464497, 08/465201, 08/466992, 08/465200, 08/469001, 08/464992, 08/465199, 08/465658, 08/464511,

08/469262, 08/469261, 08/469077, 08/469263, 08/466600, 08/466599, 08/469407, 08/471633, 08/471542, 08/469321, 08/471695, 08/471553, 08/471600, 08/471701, 08/471123, 08/471425, 08/471136, 08/469580, 08/469889, 08/469888, 08/466557, 08/470569, 08/471846, 08/469592, 08/469060, 08/471255, 08/471042, 08/471252. The serial number of the instant application is included in this list and should be disregarded. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

28. Claims 7 and 15 are rejected under the judicially created doctrine of double patenting over claim 8 of U.S. Patent No. 4,491,930 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent. The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, specifically: Figure 1D of the '930 patent, in conjunction with the associated portions of the specification discloses the input circuit, memory, display processor and display medium claimed in the application. Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. *In re Schneller,* 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP §804.

29. Claim 3 is rejected under the judicially created doctrine of double patenting over claim 5 of U.S. Patent No. 4,209,843 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent. The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, specifically:

Figures 1A-1F of the '843 patent, in conjunction with the associated portions of the specification disclose the means for acquiring, means for storing, means for registering and comparing (*correlation* of two signals or images inherently requires that they be registered in some fashion), and means for generating an output claimed in the application. Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. *In re Schneller,* 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP §804.

30. Claim 7 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 8 of U.S. Patent No. 4,491,930.

31.Claim 7 refers to an *image* rather than simply a digital input signal, lacks the *input means* and *filter means* claimed in the '930 patent claim 8 and additionally recites a *means for displaying* the scanned out image. As to the first point, it is clear that the term *signal* claimed in the '930 patent encompass image signals (see column 263, lines 26-30 of the '930 patent). As to the second point, the inclusion or exclusion of input and memory loading means does not patentably distinguish the claims as such means would be recognized by one skilled in the art as necessary and inherent components of any signal processing system whether they are explicitly claimed or not (for example, the means for generating a memory output signal in the '930 patent must include some means of loading the memory in order to function as claimed). The *means for scanning out the image* claimed in the application is, read in light of the specification, sufficiently broad to encompass the filtering or processing claimed in the '930 patent. As to the *means for*

displaying, numerous lines in the '930 specification state that the output signal may be displayed on a CRT or similar display means.

32. Note that the specification of the '930 patent has been used in this rejection only as a dictionary for interpreting the claim language. *In re Boylan,* 392 F.2d 1017, 157 USPQ 370 (CCPA 1968).

33. Claims 5 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 8 of U.S. Patent No. 4,491,930 in view of Sawada et al.

34. As compared to claim 5, claim 8 of the '930 patent differs in that it recites *a signature signal* rather than *an image*, recites a *digital input means* but not the *memory loading means* claimed in the application, and does not include the *means for scrolling* claimed in the application. The issues of image vs. signal and input/loading means has been addressed in the preceding double patenting rejection of claim 7. With respect to the scrolling means, Sawada teaches that it is well known to scroll an image in order to provide image motion. The specific sections of Sawada relied upon to teach this feature are set forth in the prior art rejection of claim 5 above and the arguments presented there are incorporated herein by reference. Since *scrolling* is a known way of accessing a memory as taught by Sawada, this limitation does not patentably distinguish the application claim 5 from the *means for generating a memory output signal* claimed in the '930 patent.

35. The recitation of a single *memory means* in the '930 patent broadly encompasses the obvious variation of the combined database and image memory (i.e., buffer or register) claimed in the application.

36. Claims 8, 9, 11, 13 and 14 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 8 of U.S. Patent No. 4,491,930 in view of Marsh and Sacks et al.

The additional limitations regarding scanning a memory to perform various transformations are not patentably distinguishable from the *output means for generating a memory output signature signal* in claim 8 of the '930 patent since these operations are clearly taught by the prior art as set forth in the prior art rejections of these claims in preceding sections. All of these obvious variations would be covered by the broad memory *output means* for which the '930 patent already provides patent protection.

37. Claim 12 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 8 of U.S. Patent No. 4,491,930 in view of Sacks, Marsh and Nickel.

Claim 12 recites additional details of the *scanning out means* and *means for displaying* which are held to be not patentably distinct from the *filter means* and *output means* claimed in the '930 patent. Scanning out in a particular way to perform image transformations such as warping has been shown in the prior art as exemplified by the Sacks, Marsh and Nickel patents (see the prior art rejection of claim 12 earlier in this action). As known types of image processing functions, these operations would be obvious variations of the filtering claimed in the '930 patent-- particularly in view of the broad definition given *filtering* by the '930 specification (column 263, lines 36+ -- ". . . the present invention has been discussed for a correlator digital filter . . . a correlator is exemplary of a generalized digital filter including recursive filters, non-

recursive filters, Kalman filters, compositor filter, and other well known filters . . . ").

38. Claim 10 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 8 of U.S. Patent No. 4,491,930 in view of Marsh.

The use of integrated circuit ROMs for storing image information does not patentably distinguish this claim from claim 8 of the '930 patent since such use of ROMs would have been obvious to one skilled in the art. Support for this holding of obviousness has already been presented above in the prior art rejection of claim 10 and those arguments are incorporated herein by reference.

39. Claims 1-2 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 8 of U.S. Patent No. 4,491,930 in view of Sacks.

Aside from the difference between *an image* and *signals*, which has already been treated in preceding paragraphs, application claim 1 differs from claim 8 of the '930 patent primarily in that it includes *geometric means* and *spatial means* as opposed to *filter means*. As argued in the double patenting rejection of claim 12 above, the functions performed by these geometric and spatial processing means are simply obvious variations of the filtering contemplated in the '930 patent. See also the associated prior art rejection of claim 1 for further arguments regarding the well-known nature of the *rotating, translating, scaling* and *perspective processing* operations.

40. The additional *optical disk* and *display monitor* details of claim 2 are likewise obvious variations of the *memory means* and *output means* claimed in the '930 patent.

41. Claim 6 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 8 of U.S. Patent No. 4,491,930 in view of Sawada and Marsh.
42. This claim recites additional details (specific size of memories, spatial and geometric processing, etc.) which are not included in claim 8 of the '930 patent but which have been shown to be obvious to one skilled in the art (see the corresponding prior art rejection of claim 6 earlier in this action). Since these additional details are simply obvious variations of the basic system which patent claim 8 covers (e.g., means for geometrically and spatially processing correspond to the broader *filter means*), they do not patentably distinguish the application claim from the patent claim.

43. Claim 18 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 8 of U.S. Patent No. 4,491,930 in view of Schure et al.

Essentially, the *means for generating an image* and *image processor* recited in claim 18 correspond to the *input means* and *filter means* of the '930 patent in an analogous manner as the claims already discussed (see the double patenting rejections of claim 7, for example). With respect to the additional details regarding *a stored program digital computer* and *digital processing logic*, the *filter means* in claim 8 of the '930 patent is clearly intended to encompass such devices. Moreover, use of a digital computer or digital logic to process image signals would have been an obvious way to implement the claimed *filter means* as exemplified by the Schure patent (see the prior art rejection of claim 18 earlier in this action).

44. Claim 20 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over

claim 8 of U.S. Patent No. 4,491,930 in view of Schure and Robinson et al.

45. The additional details of using a kernel and a weighted window are also held to be obvious additions/variations to the claimed *filter means* in the '930 patent. The obviousness arguments presented in the prior art rejection of claim 20 are incorporated herein by reference.

46. Claim 15 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 16 of U.S. Patent No. 4,553,221.

47. Application claim 15 differs from the patent claim primarily in that it does not recite generating *filtered* spatial output signal samples. It would have been obvious that the output signals of the *processor* in the application claim have been processed (i.e., filtered) since the term *processor* implies that some operation is being performed on the input signals.

48. The claims also differ in that the application claim recites a memory for storing the input signals and the patent claim recites a memory for storing the processed output signals. This difference in the use of memory is not considered patentably distinct since it is well known to both store input signals in a memory or buffer before further processing, as well as store the final output in a memory or buffer for some further application (display, other processing, etc.).

49. Claim 16 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 16 of U.S. Patent No. 4,553,221 in view of Endou et al.

Patent claim 16 simply recites *a spacial incremental processor* and does not recite the additional *geometric processor* and *spatial processor* details of application claim 15. However,

these additional limitations have been shown to be obvious in view of the prior art as set forth in the corresponding rejection above. These obvious limitations do not patentably distinguish over the *spacial incremental processor* already protected by the '221 patent.

50. While it is true that the Examiner has the burden to show how a rejection is specifically applied to each claim, the exemplary showing with respect to the claims individually discussed in detail above is enough to give the applicant fair notice of how the rejection is applied to each and every other claim. The above paragraphs establish a prima facie showing of the unpatentability of the instant claims and the burden shifts to the applicant to show, if he can, patentable distinctions between the instant claims and those of the patents.

51. The obviousness-type double patenting rejection is a judicially established doctrine based upon public policy and is primarily intended to prevent prolongation of the patent term by prohibiting claims in a second patent not patentably distinct from claims in a first patent. *In re Vogel*, 164 USPQ 619 (CCPA 1970). A timely filed terminal disclaimer in compliance with 37 C.F.R. § 1.321(b) would overcome an actual or provisional rejection on this ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 C.F.R. § 1.78(d).

52. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gerard Del Rosso whose telephone number is (703) 305-4948.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-8576.

The group fax number is (703) 308-6606.

gd
September 25, 1995

JOSEPH MARCUSO
PATENT EXAMINER
ART UNIT 266

APPENDIX

08/464034, 08/463583, 08/464979, 08/465198, 08/465173, 08/465071, 08/465657, 08/463823, 08/463822, 08/465072, 08/463111, 08/464497, 08/465201, 08/466992, 08/465200, 08/469001, 08/464992, 08/465199, 08/465658, 08/464511, 08/469262, 08/469261, 08/469077, 08/469263, 08/466600, 08/466599, 08/469407, 08/471633, 08/471542, 08/469321, 08/471695, 08/471553, 08/471600, 08/471701, 08/471123, 08/471425, 08/471136, 08/469580, 08/469889, 08/469888, 08/466557, 08/470569, 08/471846, 08/469592, 08/469060, 08/471255, 08/471042, 08/471252

Note: The serial number of the instant application is included in the above listing and should be disregarded with respect to provisional double patenting and conflicting application objections made in this Office Action.